

# OzoBlockly Editor—Computer Science via the Buzz-Buzz Game

## Student Guide

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### **Introduction**

There are a variety of variations of a game called “Buzz-Buzz”. Here is how the variation works that you and your classmates can play. You count out loud starting at zero and proceeding through 99. For any number containing the digit 7 or any number that is exactly divisible by 7, you say the word “Buzz” instead of saying the number. For numbers containing the digit 7 that are **also** divisible by 7, you speak “Buzz-Buzz” instead of saying the number. It is fun to play this as a group, each person taking his or her turn in dealing with the next number in the sequence.

Just to be clear, here is how the counting would begin: *Buzz, 1, 2, 3, 4, 5, 6, Buzz-Buzz, 8, 9, 10, 11, 12, 13, Buzz, 15, 16, Buzz, 18, 19, 20, Buzz, 22, 23, 24, ...*

When playing this game, each player takes his or her turn in the counting process, speaking the number, Buzz, or Buzz-Buzz as appropriate. If a player makes a mistake, then counting starts all over again at zero with the player making the mistake. Oh yes—be careful when starting to count at zero!

### **Learning Some Computer Science**

Let’s see how you can learn some computer science (and math as a side benefit!) by designing an Ozobot Editor program that inputs a number between 0 and 99 and uses the basic rules of the game: If the number is **both** divisible by 7 **and** contains a 7, then Ozobot does a “Buzz-Buzz”. However, if the number contains a 7 **or** is divisible by 7 (*just one of these two*), then Ozobot will do a lone “Buzz”. If the number **neither contains** a 7 **nor** is divisible by 7, then Ozobot will just output the number with no buzzes.

You’ll also program Ozobot to display its top light colors as follows:

- **Green** if the number is **both** divisible by 7 **and** contains a 7
- **Blue** if the number contains a 7 **or** is divisible by 7 (*just one of these two*)
- **Red** if the number **neither** contains a 7 **nor** is divisible by 7.

The program that you will be studying will work for both Evo and Ari. There will be some differences, however, as Evo does not have a color touchscreen display like Ari. Instead, items that would display on Ari’s touchscreen appear on the **Terminal** in the lower right side of the Ozoblockly Editor screen. Figure 1 shows examples of both Ari’s touchscreen and the editor’s terminal for Evo when the program is run.

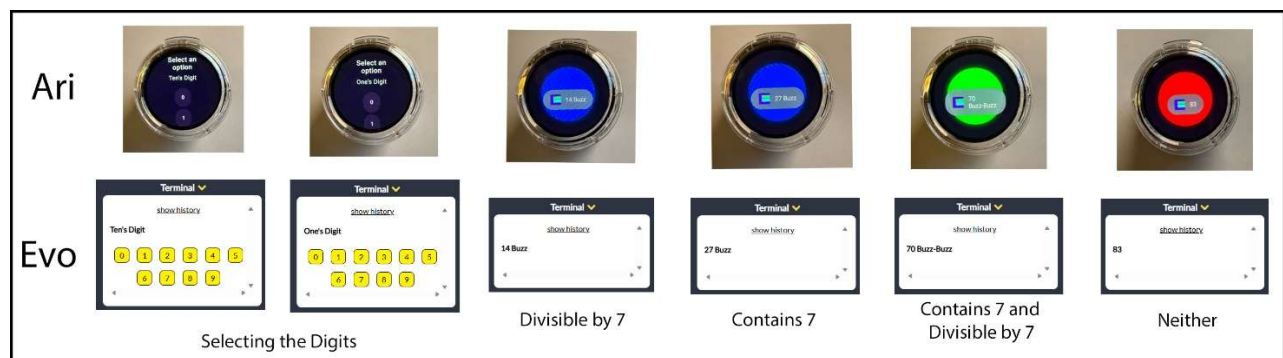


Figure 1

### The Ozoblockly Editor Program

One very important component of this program is a function that allows the user to input one of the digits between 0 and 9 inclusive, as shown in "Selecting the Digits" in Figure 1. This is accomplished as shown in the documented function "Get Digit from User" of Figure 2.

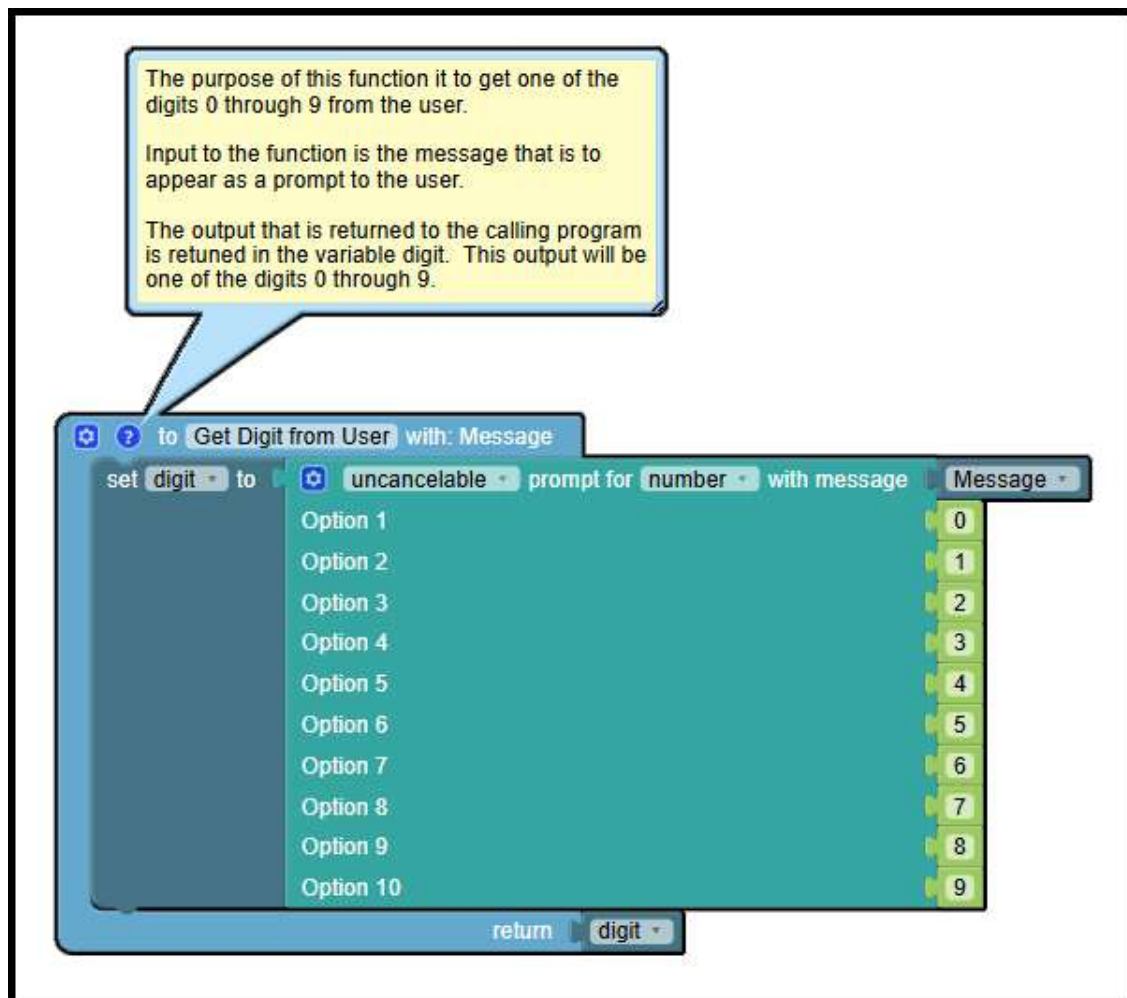


Figure 2

The rest of the program, also documented, is shown in Figure 3.

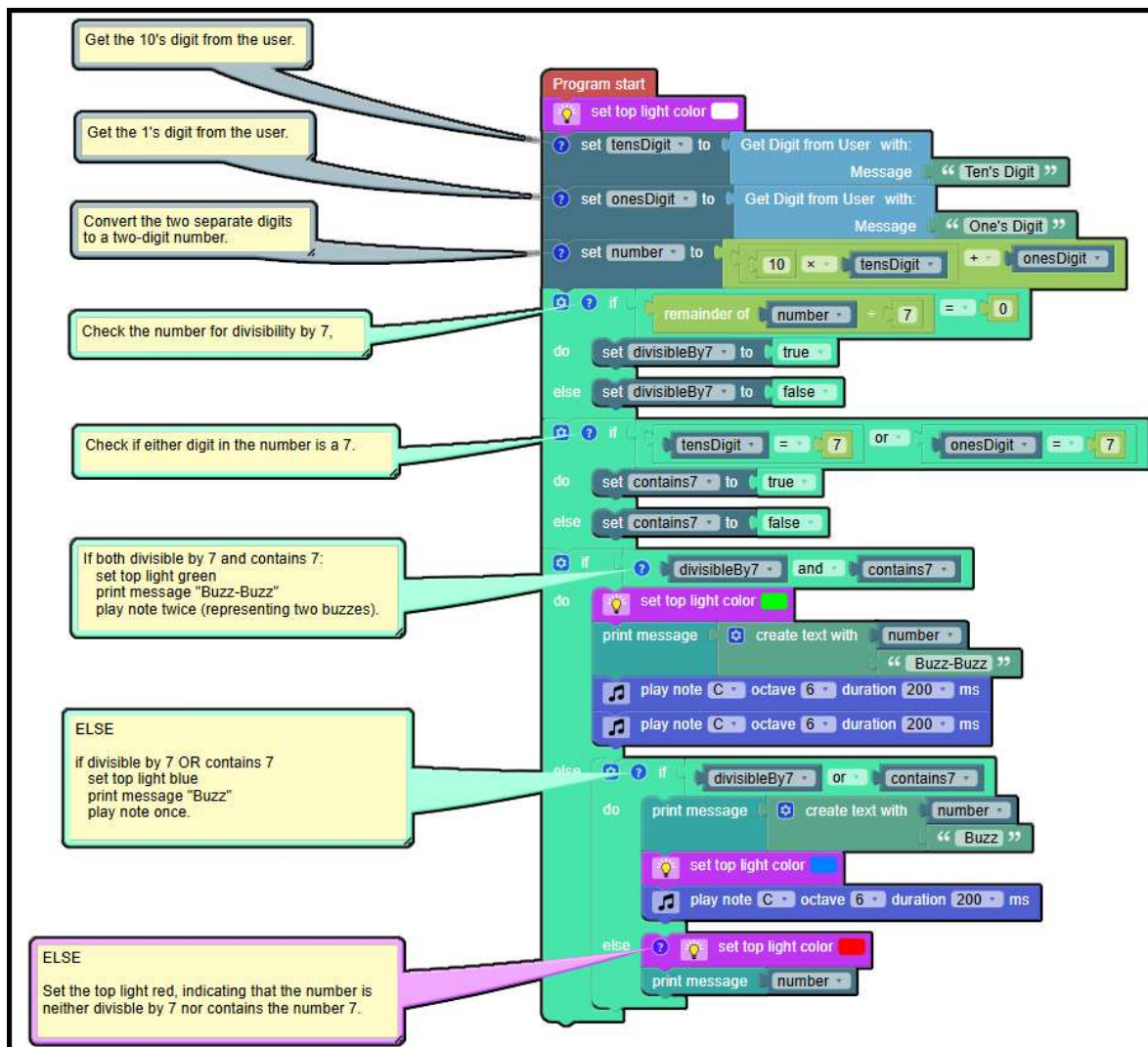


Figure 3

*Remarks on “Check the number for divisibility by 7.”* Here is where you can learn some math that you may not be aware of. Checking a number for divisibility by  $x$  involves looking at the remainder when the number is divided by  $x$ . If the remainder is zero, then the number is divisible by  $x$  with no remainder.

The variables *divisibleBy7* and *contains7* are **logical variables**. Allowed values for logical variables are **true** and **false**. The result of an AND is *true* only if both of its parameters are *true*. The result of an OR is *true* if at least one of its two parameters are *true*. The order of the *if*'s in the double-nested if block is critical. “Divisible AND contains” must be first, followed by “divisible OR contains”. If neither of those are true, then you just display the number with a red top light.

The “create text with” block allow concatenating as many items as you wish. Concatenation means “a series of interconnected things”.

### ***Program Modification Exercise***

Ozobot Editor allows numbers larger than 99. Modify the program so that it will work as intended for numbers as high as 199. Test your modified program on the following numbers:

- 105    Divisible by 7
- 137    Contains 7
- 147    Divisible by 7 AND Contains 7
- 175    Divisible by 7 AND Contains 7
- 191    Neither